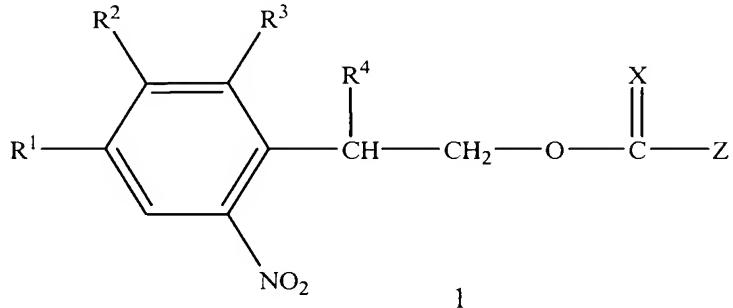


IN THE CLAIMS

Please amend the claims as follows:

Claim 1 (Currently Amended): A compound having the formula (1):



wherein

R¹ is selected from the group consisting of H, NO₂, CN, OCH₃, a halogen, an alkyl having up to 4 carbon atoms, and an alkoxy having up to 4 carbon atoms;

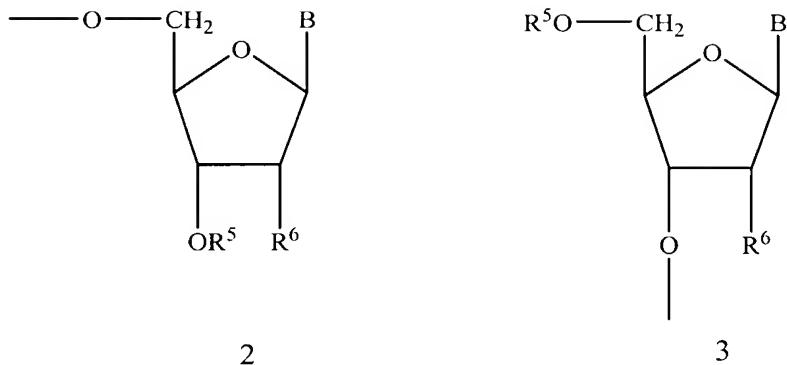
R² is selected from the group consisting of an aryl group, a substituted aryl group, a heteroaryl group, substituted heteroaryl group, an aroyl group, and a substituted aroyl group;

R³ is selected from the group consisting of H, NO₂ and a halogen;

R⁴ is selected from the group consisting of H, OCH₃ and an alkyl group having up to 4 carbon atoms;

X is selected from the group consisting of oxygen and sulfur; and

Z is selected from the group consisting of a leaving group, an alcoholate group, -OH, a N-atom of an amine compound, a deoxyribonucleoside and a ribonucleoside as represented by either of the following formulae (2) or (3):



wherein

R<sup>5</sup> is selected from the group consisting of a H, an oligonucleotide, a phosphitamidite group and a protecting group functional group useful in oligonucleotide synthesis;

R<sup>6</sup> is selected from the group consisting of H, OH, an alkoxy having up to 4 carbon atoms, an alkenoxyl group having up to 4 carbon atoms, a substituted alkenoxyl group having up to 4 carbon atoms, or R<sup>6</sup> is WR<sup>8</sup> wherein W is selected from oxygen and sulfur and R<sup>8</sup> is a protective group useful in oligonucleotide synthesis;

B is a base selected from the group consisting of adenine, cytosine, guanine, thymine, and uracil and chemical modifications thereof, and when B is any one of adenosine, cytosine and guanine the amino functions on the heterocycle may bear a protective group useful in oligonucleotide synthesis; or

~~Z is selected from the group consisting of a chemically modified deoxyribonucleoside, a chemically modified ribonucleoside, and an analog thereof.~~

Claim 2 (Canceled).

Claim 3 (Previously Presented): The compound of claim 1, wherein R<sup>1</sup> is H and R<sup>2</sup> is phenyl or substituted phenyl.

Claim 4 (Previously Presented): The compound of claim 1, wherein R<sup>1</sup> is H and R<sup>2</sup> is benzoyl or substituted benzoyl.

Claim 5 (Previously Presented): The compound of claim 1 wherein W is O and R<sup>8</sup> is selected from the group consisting of an alkyl, alkenyl, acetal and silylether protective group.

Claim 6 (Previously Presented): The compound of claim 1, wherein W is S and R<sup>8</sup> is an alkyl protective group.

Claim 7 (Previously Presented): The compound of claim 1, wherein R<sup>6</sup> is selected from the group consisting of an O-methyl, O-ethyl, O-allyl, O-tetrahydropyranyl- O-methoxytetrahydropyranyl and an O-t-butyldimethylsilyl.

Claim 8 (Previously Presented): The compound of claim 1, wherein B is selected from the group consisting of adenine, cytosine and guanine and wherein R<sup>8</sup> is selected from the group consisting of phenoxyacetyl, 4-tert-butyl-phenoxyacetyl, 4-isopropyl-phenoxyacetyl and dimethylformamidino.

Claim 9 (Previously Presented): The compound of claim 1, wherein B is adenine and is selected from the group consisting of benzoyl and p-nitrophenyloxycarbonyl (p-NPEOC).

Claim 10 (Previously Presented): The compound of claim 1, wherein B is guanine and wherein R<sup>8</sup> is selected from the group consisting of isobutyroyl and p-nitrophenylethyloxycarbonyl (p-NPEOC).

Claim 11 (Previously Presented): The compound of claim 1, wherein B is cytosine and wherein R<sup>8</sup> is selected from the group consisting of benzoyl, isobutyroyl and p-nitrophenylethoxy carbonyl (p-NPEOC).

Claim 12 (Currently Amended): The compound of claim 1, wherein R<sup>5</sup> is a phosphitamide phosphitamidite group.

Claim 13 (Previously Presented): The compound of claim 1, wherein R<sup>5</sup> is an OH-protective group.

Claim 14 (Previously Presented): The compound of claim 13, wherein R<sup>5</sup> is a dimethoxytrityl- or a monomethoxytrityl- group.

Claim 15 (Original): The compound of claim 13, wherein R<sup>5</sup> is a silyl-group.

Claim 16 (Previously Presented): The compound of claim 1, wherein Z is a leaving group.

Claim 17 (Previously Presented): The compound of claim 16, wherein the leaving group is selected from the group consisting of chloride, imidazolyl and nitrophenoxyl.

Claims 18-23 (Canceled)

Claim 24 (Withdrawn-Currently Amended): A method for the light-controlled synthesis of oligonucleotides, wherein said method is comprised of the following steps:

- a) attaching, as a first building block, a nucleoside or nucleotide of claim 1 comprising the photolabile protective group at its primary hydroxyl group, to a support via its 3' secondary hydroxyl group;
- b) irradiating the support-bound nucleoside or nucleotide resulting from step a), such that the protective group at the primary hydroxyl group is removed, thereby deprotecting the primary hydroxyl group;
- c) reacting the support-bound nucleotide resulting from step b) in the presence of an activator with a second nucleotide selected from claim 12 comprising a protective group at its primary hydroxyl group and phosphoramidite functional group at its 3' secondary hydroxyl group, to form an internucleosidic phosphorous linkage;
- d) optionally capping unreacted primary hydroxyl groups with an inert alcohol protecting group;
- e) oxidizing the internucleosidic phosphorous linkage to the naturally occurring pentavalent state;
- f) iterating steps b) to d) while successively applying the phosphoramidite building blocks in a predetermined order until the desired oligonucleotide strand is completed; and
- g) removing of all nucleobase and phosphate protective groups.

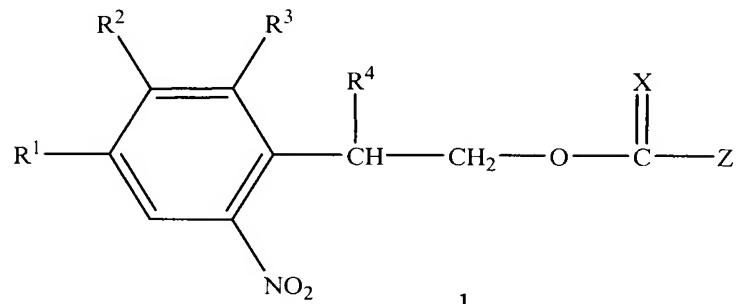
Claim 25 (Withdrawn-Currently Amended): A method for the light-controlled synthesis of oligonucleotides, wherein said method is comprised of the following steps:

- a) attaching, [[a]] as a first building block, a nucleoside or nucleotide of claim 1 comprising the photolabile protective group at its 3' secondary hydroxyl group, to a support via its primary hydroxyl group;

- b) irradiating the support-bound nucleotide resulting from step a), such that the protective group at the secondary hydroxyl group is removed, thereby deprotecting the 3' secondary hydroxyl group;
- c) reacting the support-bound nucleotide resulting from step b) in the presence of an activator with a second nucleotide selected from claim 12 comprising a protective group at its 3' secondary hydroxyl group and a phosphoramidite functional group at its primary hydroxyl group, to form an internucleosidic phosphorous linkage;
- d) optionally capping unreacted secondary hydroxyl groups with an inert alcohol protecting group;
- e) oxidizing the internucleosidic phosphorous linkage to the naturally occurring pentavalent state;
- f) iterating steps b) to d) while successively applying the phosphoramidite building blocks in a predetermined order until the desired oligonucleotide strand is completed; and
- g) removing of all nucleobase and phosphate protective groups.

Claims 26-29 (Canceled).

Claim 30 (Currently Amended): A compound having the formula (1):



wherein

$R^1$  is  $\text{COOY}$ , wherein Y is selected from the group consisting of an alkyl group of up to 10 carbon atoms,

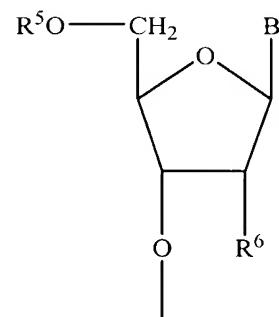
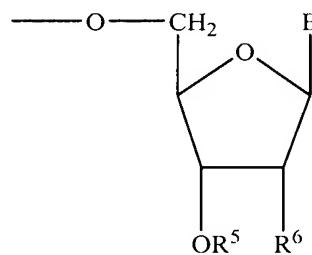
$R^2$  is selected from the group consisting of H,  $\text{NO}_2$ , CN,  $\text{OCH}_3$ , a halogen, an alkyl having up to 4 carbon atoms, an alkoxy having up to 4 carbon atoms;

$R^3$  is selected from the group consisting of H,  $\text{NO}_2$  and halogen;

$R^4$  is selected from the group consisting of  $\text{OCH}_3$ , an alkyl group having up to 4 carbon atoms and an optionally substituted alkyl group having up to 4 carbon atoms;

X is selected from the group consisting of oxygen or sulfur; and

Z is selected from the group consisting of a leaving group, an alcoholate,  $-\text{OH}_2$ , a N-atom of an amine compound, a deoxyribonucleoside and a ribonucleoside as represented by either of the following formulae (2) or (3):



wherein

$R^5$  is selected from the group consisting of a H, an oligonucleotide, a phosphitamidite group and a protecting group functional group useful in oligonucleotide synthesis;

$R^6$  is selected from the group consisting of H, OH, an alkoxy having up to 4 carbon atoms, an alkenoxy having up to 4 carbon atoms, or a substituted alkenoxy having up to 4 carbon atoms, or  $R^6$  is  $WR^8$  wherein W is selected from oxygen and sulfur and  $R^8$  is selected from a protective group useful in oligonucleotide synthesis;

B is base selected from the group consisting of adenine, cytosine, guanine, thymine, and uracil, and chemical modifications thereof and in the case of adenosine, cytosine and

guanine the amino functions on the heterocycle may bear a protective group useful in oligonucleotide synthesis; or

~~Z is selected from the group consisting of a chemically modified deoxyribonucleoside, a chemically modified ribonucleoside, and an analog thereof.~~

Claim 31 (Previously Presented): The compound of claim 30, wherein Y is an alkyl group selected from the group consisting of methyl and tertiary-butyl, and R<sup>2</sup> is H.

Claim 32 (Previously Presented): The compound of claim 30 wherein W is O and R<sup>8</sup> is selected from the group consisting of an alkyl, alkenyl, acetal and silylether protective group.

Claim 33 (Previously Presented): The compound of claim 30 wherein W is S and R<sup>8</sup> is selected from the group consisting of an alkyl protective group.

Claim 34 (Previously Presented): The compound of claim 30, wherein R<sup>6</sup> is selected from the group consisting of an O-methyl, O-ethyl, O-allyl, O-tetrahydropyranyl- O-methoxytetrahydropyranyl and an O-t-butyldimethylsilyl.

Claim 35 (Previously Presented): The compound of claim 30, wherein B is selected from the group consisting of adenine, cytosine and guanine and said protective group is selected from the group consisting of phenoxyacetyl, 4-tert-butyl-phenoxyacetyl, 4-isopropyl-phenoxyacetyl and dimethylformamidino.

Claim 36 (Previously Presented): The compound of claim 30, wherein B is adenine and the protective group is selected from the group consisting of benzoyl and p-nitrophenyloxycarbonyl (p-NPEOC).

Claim 37 (Previously Presented): The compound of claim 30, wherein B is guanine and the protective group is selected from the group consisting of isobutyroyl and p-nitrophenylethyloxycarbonyl (p-NPEOC).

Claim 38 (Previously Presented): The compound of claim 30, wherein B is cytosine and the protective group is selected from the group consisting of benzoyl, isobutyroyl and p-nitrophenylethyloxycarbonyl (p-NPEOC).

Claim 39 (Currently Amended): The compound of claim 30, wherein R<sup>5</sup> is a phosphitamide phosphitamidite group.

Claim 40 (Previously Presented): The compound of claim 30, wherein R<sup>5</sup> is an OH- protective group.

Claim 41 (Previously Presented): The compound of claim 40, wherein R<sup>5</sup> is selected from a dimethoxytrityl- or a monomethoxytrityl- group.

Claim 42 (Previously Presented): The compound of claim 40, wherein R<sup>5</sup> is a silyl-group.

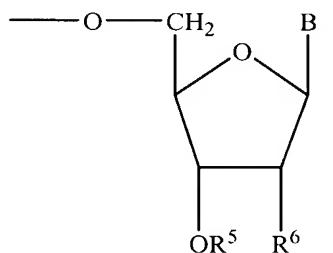
Claim 43 (Previously Presented): The compound of claim 30, wherein Z is a leaving group.

Claim 44 (Previously Presented): The compound of claim 43, wherein the leaving group is selected from the group consisting of chloride, imidazolyl and nitrophenoxy.

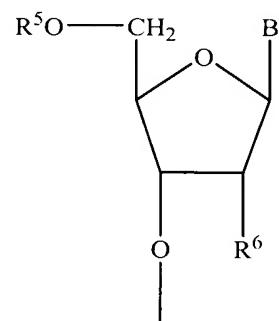
Claim 45 (Previously Presented): The compound of claim 31, wherein Z is a leaving group.

Claim 46 (Previously Presented): The compound of claim 45, wherein the leaving group is selected from the group consisting of chloride, imidazolyl and nitrophenoxy.

Claim 47 (Previously Presented): The compound of claim 1, wherein Z is a deoxyribonucleoside or a ribonucleoside represented by formulae (2) or (3):



2



3

wherein R<sup>5</sup> is selected from the group consisting of a H and an oligonucleotide;

R<sup>6</sup> is selected from the group consisting of H, OH, an alkoxy having up to 4 carbon atoms, an alkenoxyl group having up to 4 carbon atoms, a substituted alkenoxyl group having up to 4 carbon atoms, or R<sup>6</sup> is WR<sup>8</sup> wherein W is selected from oxygen and sulfur and R<sup>8</sup> is a protective group;

B is selected from the group consisting of adenine, cytosine, guanine, thymine and uracil.

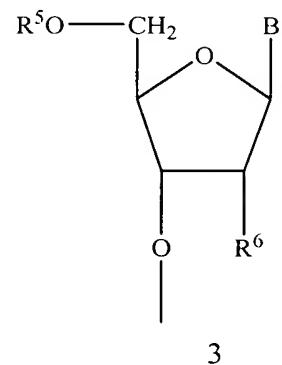
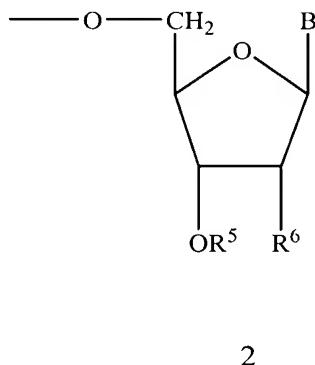
Claim 48 (Previously Presented): The compound of claim 1, wherein Z is selected from the group consisting of a deoxyribonucleoside and a ribonucleoside.

**Claim 49 (Previously Presented):** The compound of claim 1, wherein Z is selected from the group consisting of an alcoholate group, -OH and an amine.

Claim 50 (Previously Presented): The compound of claim 1, wherein  $R^2$  is a phenyl group;

$R^4$  is a hydrogen atom or an alkyl group having up to 4 carbon atoms;  
 $X$  is O;

and Z is a deoxyribonucleoside or a ribonucleoside represented by formulae (2) or (3);

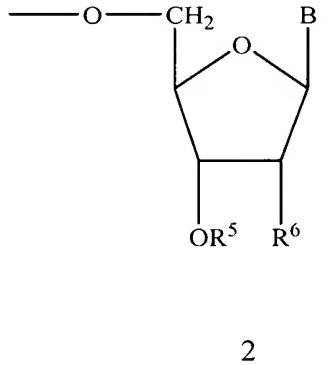


wherein  $R^5$  is H;

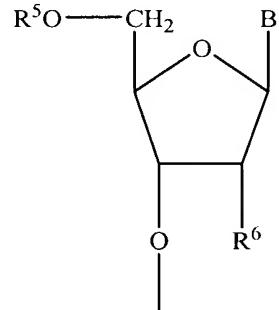
$R^6$  is selected from the group consisting of H, OH, an alkoxy having up to 4 carbon atoms, and an alkenoxyl group having up to 4 carbon atoms; and

B is selected from the group consisting of adenine, cytosine, guanine, thymine and uracil.

Claim 51 (Previously Presented): The compound of claim 30, wherein Z is a deoxyribonucleoside or a ribonucleoside represented by formulae (2) or (3):



2



3

wherein R<sup>5</sup> is selected from the group consisting of a H and an oligonucleotide;  
R<sup>6</sup> is selected from the group consisting of H, OH, an alkoxy having up to 4 carbon atoms, an alkenoxyl group having up to 4 carbon atoms, a substituted alkenoxyl group having up to 4 carbon atoms, or R<sup>6</sup> is WR<sup>8</sup> wherein W is selected from oxygen and sulfur and R<sup>8</sup> is a protective group;  
B is selected from the group consisting of adenine, cytosine, guanine, thymine and uracil.

Claim 52 (Previously Presented): The compound of claim 30, wherein Z is selected from the group consisting of a deoxyribonucleoside and a ribonucleoside.

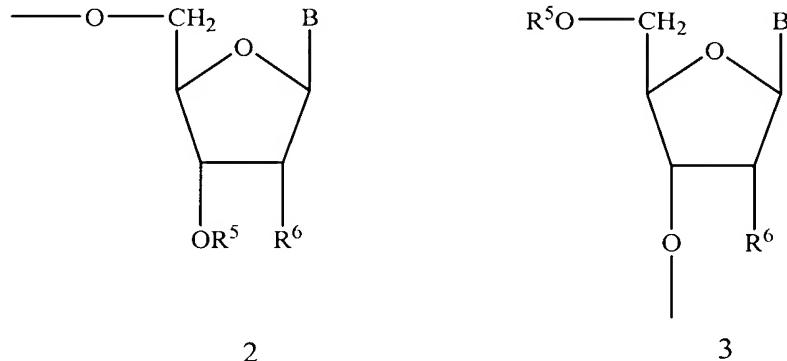
Claim 53 (Previously Presented): The compound of claim 30, wherein Z is selected from the group consisting of an alcoholate group, -OH and an amine.

Claim 54 (Previously Presented): The compound of claim 30, wherein R<sup>2</sup> is a phenyl group;

$R^4$  is a hydrogen atom or an alkyl group having up to 4 carbon atoms;

$X$  is O;

and  $Z$  is a deoxyribonucleoside or a ribonucleoside represented by formulae (2) or (3):



wherein  $R^5$  is H;

$R^6$  is selected from the group consisting of H, OH, an alkoxy having up to 4 carbon atoms, and an alkenoxy group having up to 4 carbon atoms;  
and

$B$  is selected from the group consisting of adenine, cytosine, guanine, thymine and uracil.

Claim 55 (Previously Presented): The compound of claim 1, wherein  $R^1$  and  $R^3$  are selected from the group consisting of H and NO<sub>2</sub>, wherein  $R^1$  and  $R^3$  are not both NO<sub>2</sub>;  
 $R^2$  is selected from the group consisting of a phenyl group and a benzoyl group;  
 $R^4$  is selected from the group consisting of a methyl group and an ethyl group; and  
 $X$  is oxygen.

Claim 56 (Previously Presented): The compound of claim 55, wherein  $Z$  is a deoxyribonucleoside;

$R^6$  = H; and

B is selected from the group consisting of adenine, cytosine, guanidine, thymine and uracil.

Claim 57 (Previously Presented): The compound of claim 1, wherein Z is a deoxyribonucleoside;

$R^6 = H$ ; and

B is selected from the group consisting of adenine, cytosine, guanidine, thymine and uracil.